AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions and listings of claims in this application:

1. (Currently Amended) A method of producing a semiconductor structure having at least one support substrate and an ultrathin layer comprising:

bonding a support substrate to a source substrate, wherein the source substrate includes a front face and a zone of weakness below the front face that defines an useful layer, the useful layer being of sufficient thickness to withstand heat treatments without forming defects therein and at least about 300 nanometers thick so that it can be reduced in thickness to form the ultrathin layer;

detaching the useful layer along the zone of weakness to obtain an intermediate structure including at least the transferred useful layer and the support substrate; and

treating the transferred useful layer to obtain an ultrathin layer on the support substrate that is suitable for use in applications in the fields of electronics, optoelectronics or optics.

2. (Original) The method of claim 1 which further comprises providing an intermediate layer on the support substrate or on the source substrate before the bonding step such that, after the detaching step, an alternate intermediate structure is obtained that includes the support substrate, the intermediate layer and the useful layer.

3. (Original) The method of claim 2 wherein the intermediate layer has a thickness that is equal or less than about 50 nanometers.

4. (Original) The method of claim 2 wherein the intermediate layer is made of insulating material.

5. (Original) The method of claim 4 wherein the intermediate layer is made of a material of at least one of silicon oxide, silicon nitride, a high permittivity insulating material, diamond, or a combinations of the materials.

6. (Original) The method of claim 1 wherein the useful layer is at least three times thicker than the ultrathin layer before treatment.

7. (Cancelled)

8. (Original) The method of claim 1 wherein the ultrathin layer is equal to or less than about 100 nanometers thick following the treating step.

9. (Original) The method of claim 8 wherein the ultrathin layer is less than about 50 nanometers thick.

10. (Original) The method of claim 1 which further comprises treating the transferred useful layer by using at least one of chemical-mechanical polishing, annealing in an atmosphere containing hydrogen, argon or a mixture thereof, sacrificial oxidation, and chemical etching.

11. (Original) The method of a claim 1 which further comprises heat annealing conducted after the bonding step and before the treatment step.

12. (Original) The method of claim 11 wherein the heat annealing is conducted during the detaching step.

13. (Original) The method of claim 11 wherein heat annealing treatment is conducted before the detaching step.

14. (Original) The method of claim 1 which further comprises providing the zone of weakness by atomic species implantation.

15. (Original) The method of claim 1 which further comprises providing the zone of weakness as a porous layer in the source substrate.

16. (Original) The method of claim 1 which further comprises applying at least one of mechanical and thermal stresses during the detaching step.

17. (Original) The method of claim 1 which further comprises etching cavities into a front face of the useful layer before bonding.

18. (Original) The method of claim 1 wherein the source substrate is made of at least one of silicon, silicon carbide, germanium, silicon germanium, a Group (IV-IV) compound material, and a Group (III-V) compound material.

19. (Original) The method of claim 1 wherein the support substrate is made of at least one of silicon, silicon carbide, germanium, silicon germanium, a Group (IV-IV) compound, and a Group (III-V) compound.

20. (New) A method of producing a semiconductor structure having at least one support substrate and an ultrathin layer comprising:

bonding a support substrate to a source substrate, wherein the source substrate includes a front face and a zone of weakness below the front face that defines an useful layer, the useful layer being of sufficient thickness to withstand heat treatments without forming defects therein so that it can be reduced in thickness to form the ultrathin layer;

detaching the useful layer along the zone of weakness to obtain an intermediate structure including at least the transferred useful layer and the support substrate;

providing an intermediate layer on the support substrate or on the source substrate before the bonding step such that, after the detaching step, an alternate intermediate structure is obtained that includes the support substrate, the intermediate layer and the useful layer; and

treating the transferred useful layer to obtain an ultrathin layer on the support substrate that is suitable for use in applications in the fields of electronics, optoelectronics or optics;

wherein the intermediate layer has a thickness that is equal or less than about 50 nanometers and the useful layer is at least about 300 nanometers thick.

21. (New) A method of producing a semiconductor structure having at least one support substrate and an ultrathin layer comprising:

bonding a support substrate to a source substrate, wherein the source substrate includes a front face and a zone of weakness below the front face that defines an useful layer, the useful layer being of sufficient thickness to withstand heat treatments without forming defects therein so that it can be reduced in thickness to form the ultrathin layer;

detaching the useful layer along the zone of weakness to obtain an intermediate structure including at least the transferred useful layer and the support substrate;

providing an intermediate layer on the support substrate or on the source substrate before the bonding step such that, after the detaching step, an alternate intermediate structure is obtained that includes the support substrate, the intermediate layer and the useful layer;

treating the transferred useful layer to obtain an ultrathin layer on the support substrate that is suitable for use in applications in the fields of electronics, optoelectronics or optics; and

which further comprises treating the transferred useful layer by using at least one of chemical-mechanical polishing, annealing in an atmosphere containing hydrogen, argon or a mixture thereof, sacrificial oxidation, and chemical etching;

wherein the intermediate layer is made of a material of at least one of silicon oxide, silicon nitride, a high permittivity insulating material, diamond, or a combinations of the materials, the useful layer is at least three times thicker than the ultrathin layer before treatment, and the ultrathin layer is equal to or less than about 100 nanometers thick following the treating step.